

Fast Channel Dropping Filter Switch

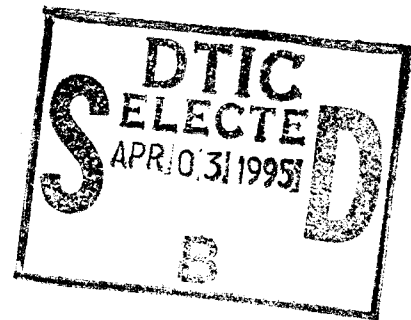
Contract N00014-94-C-0224

BMDO Topic #94-016

Technical Progress Report #1

October 1, 1994 - November 30, 1994

PI: Michael J. Brinkman
Deacon Research
2440 Embarcadero Way
Palo Alto, CA 94303
(415) 493-6100



Deliver to:

Program Officer
Office of Naval Research
800 No. Quincy St.
Arlington, Virginia 22217-5660

Attn: William Miceli ONR Code 4414

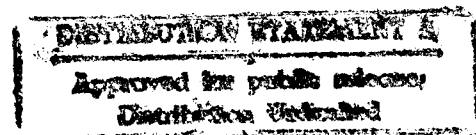
Ref: Contract N00014-94-C-0224

Defense Technical Information Center
Bldg. 5, Cameron Station
Alexandria, Virginia 22304-6145

Administrative Contracting Officer
DCMAO San Francisco
1861 Borregas Avenue
Sunnyvale, CA 94089-1308

Ballistic Missile Defense Organization
Attn: T/IS
The Pentagon
Washington, D.C. 20301-7100

Director, Naval Research Laboratory
ATTN: Code 2627
Washington, DC 20375-5326



19950328 195

During the first two months of this program, we have completed the first two tasks, design of the grating and waveguide masks. We are currently optimizing the poling of a $4.5\text{ }\mu\text{m}$ period, which we plan to use in our device in Phase I. The $4.5\text{ }\mu\text{m}$ period provides a 15th order Bragg retroreflection for a wavelength of $1.3\text{ }\mu\text{m}$. The mask consists of a series of stripes with a 50% duty cycle, optimizing the efficiency of the grating reflection.

We have completed our waveguide mask design. This mask consists of a series of straight parallel waveguides with varying widths from 1.5 to $8\text{ }\mu\text{m}$. The advantages of varying widths are twofold. First, different waveguide sizes enable us to test several wavelengths in single mode guides on the same device. The sensitivity of single mode operation to processing parameters is reduced, so we should be able to find a single mode waveguide for one of the widths. Higher order modes are undesirable, since the difference in the effective index between the modes causes a different wavelength for peak reflectivity for the two modes. Secondly, the effective index of the lowest order waveguide mode varies with the waveguide width as well. A measurement of the wavelength at peak reflectivity will enable us to measure the sensitivity of wavelength to waveguide width as well as processing parameters. We have decided not to work with a Y-branching waveguide structure at this time in order to focus on our basic understanding of the poled grating structure.

We are adding a grating characterization step to our program before we proceed with the waveguide fabrication on our device. In particular, we are examining the bulk Bragg reflection properties of the grating. This enables us to unambiguously characterize the grating itself without guided mode effects. We can then look at the reflection off the grating at different angles of incidence and measure the efficiency at lower Bragg diffraction orders.

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By <i>Parletter</i>	
Distribution/Availability	
Availability Codes	
Dist	Avail and/or Spec
A-1	